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**A MULTI-MATERIAL RECYCLING SYSTEM
IN RENFREW COUNTY
BY
BEAUMEN WASTE MANAGEMENT
SYSTEMS LTD.**

FEBRUARY 1995



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Environment
and Energy**

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IN RENFREW COUNTY
BY
BEAUMEN WASTE MANAGEMENT SYSTEMS LTD.**

Report prepared by:

Beauman Waste Management Systems Ltd.
Renfrew, Ontario

Report prepared for:

Program Development Branch
Ontario Ministry of Environment and Energy

DISCLAIMER

This report was prepared for the Ontario Ministry of Environment and Energy as part of a Ministry-funded project. The views and ideas expressed in this report are those of the authors and do not necessarily reflect the views and policies of the Ministry of Environment and Energy, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

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ABSTRACT

In May, 1991 Beaumen Waste Management Systems Ltd. (BWMS) embarked on a plan to set up and operate a curbside and depot recycling program for municipalities and commercial customers for all of Renfrew County, Ontario. This project involved purchasing collection trucks, recyclable material processing equipment for two recycling facilities, and transportation vehicles to ship all of Renfrew County's recyclables to Canadian markets.

At the official project start date of July, 1993 BWMS was collecting, 324.6 tonnes of recyclables. The equipment in our recycling processing plants in Renfrew and Pembroke was ordered and installed with that tonnage as a guide, however, the fact that our research indicated these tonnages and the number of products collected would be increasing was also factored in. By June of 1994 BWMS, with its new equipment was collecting, processing, and shipping 467.4 tonnes (up 44%) and the number of recyclables had increased from eight to twenty. No major operating problems were encountered.

BWMS is now doing the recycling in 35 of the 36 municipalities in Renfrew County as well as parts of Pontiac, Lanark, and Lennex and Addington Counties. We also service more than 300 Industrial, Commercial, and Institutional (IC & I) customers and provide full recycling consulting services to all our clients.

The largest challenges to the project have been:

- 1) Increased competition from three recycling companies resulting in a 15-20% recyclable material tonnage loss in Renfrew County
- 2) Large stores and some industries handling their own recycling programs resulting in an additional 5-10% material reduction.

The addition of the new recycling equipment, however, has made BWMS very competitive and will allow the Company to grow further and overcome many of these hurdles.

INTRODUCTION

1.1. Company History

Beaumen Waste Management Systems Ltd. (BWMS) is a full service recycling, waste pick up, and landfill management company which services municipal as well as Industrial, Commercial, and Institutional (IC & I) customers. BWMS owns and operates two fully functional recycling processing centres in Pembroke and Renfrew, Ontario making recycling the largest component of its business.

The company began fifteen years ago as a waste management firm under the ownership of Mr. R. Beauregard. The present owners, Daniel and Vivian Menard (President and Vice-President respectively) purchased the business in 1988 and initially operated it as a partnership under the name of Beaumen Industries. BWMS was incorporated in 1990 at which time the addition of recycling services was well underway, albeit on a much more limited scale than today.

1.2 Project History

By 1990 it was realized that recycling should become an integral part of BWMS for 2 main reasons:

- 1) Existing clients were demanding recycling services in addition to their waste removal.
- 2) No recycling facilities existed in Renfrew County for either the IC & I or the Municipal sectors.

Late in 1990 most Renfrew County municipalities' recycling efforts had stalled due to indecision, "red tape", and internal problems over owning and operating their own processing plant in such an under populated county. BWMS took the initiative and purchased a vacant warehouse in Renfrew for a recyclable material processing facility. Because of the large size of the county, a second building was rented for a recyclable material transfer station in Pembroke. Both facilities received Certificates of Approval from the Ministry of Environment and Energy (MOEE) in March 1991, and shortly thereafter BWMS was chosen by most Renfrew County municipalities to handle their complete recycling programs.

1.2 Project History (con't)

Briefly, the Project Proposal that BWMS made to the MOEE consisted of the following:

Renfrew Processing Plant

- 1 Baler (for material compaction)
- 1 Delivery/Sorting conveyor with two magnetic inclined conveyors
- 1 Densifier (for steel and aluminum cans)
- 1 Paper shredder (used)
- 1 Floor Scale
- 1 Bobcat with attachments
- 2 Recycle trucks
- 8 Rear packer trucks
- 1 Truck scale
- 2 Dump trailers

Pembroke Transfer Station

- 1 Baler (for material compaction)
- 1 Delivery/Sorting conveyor with two magnetic inclined conveyors.
- 1 Densifier (for steel and aluminum cans)
- 2 Roll-Off trucks
- 12 Roll-Off containers
- 1 Bobcat
- 4 Recycle trucks

Depot Municipality Collection

- 2 Recycle trucks
- 400 360 litre roll-out plastic carts

With the above machinery in place BWMS could efficiently collect, process, and sell all of the municipal and IC & I recyclables from Renfrew County and the immediate surrounding area.

1.3 Project Goals

The objective of the project was to set up and operate a curbside blue box and depot recycling service for municipalities and IC & I customers throughout Renfrew County including a modern, efficient processing centre in Renfrew, Ontario. As the scope of the project was revealed, it became evident that a processing centre in Pembroke would also be needed because of the extreme size of Renfrew County.

1.3 Project Goals (con't)

At the project's start BWMS estimated a diversion of approximately 18,600 tonnes of recyclables from municipalities and the IC & I sectors in Renfrew County and surrounding area. A great deal of research went in to this estimate, including information from a \$10,000 recycling feasibility study by Proctor and Redfern (1) for the 22 Renfrew County municipalities in the Renfrew South Recyclers Association. Data was also used from our more than two years of recycling efforts in several municipalities in the County, and from a small but representative sample of IC & I customers that BWMS had at that time.

Two assumptions were made when determining the tonnage estimates:

- 1) that BWMS would be the only recycling company in this remote area.
- 2) that most, if not all large chain stores and grocery stores in Renfrew County would use BWMS for their recycling.

THE PROJECT SUMMARY

2.0. Introduction

Although some of the equipment BWMS finally purchased differed slightly from the original proposal, the overall recycling concepts and long term Company plan remained the same. Much planning was done to ensure that the equipment BWMS purchased would handle not only the recyclables which the Company had currently found markets for but many others that showed a strong potential as future recyclables.

Another main concern was the large geographical area (Appendix A) and relatively small population that the project would encompass. All collection equipment purchases, especially the trucks, would have to reflect that fact.

The project was more difficult than had been anticipated with respect to finding banks, loan institutions, or private investors to assist with the total financial requirements for the project. The above took about 14 months to finalize and BWMS fully realized that a project of this magnitude would not have been possible without the funding provided by the MOEE.

- (1) The Proctor and Redfern Group - Consulting Engineers and Planners, Published February 15, 1990.

2.1 Balers and Attached Conveyors (Appendix B-Figure 1)

Renfrew -- AMBACO horizontal baler (wide mouth)
-- single ram
-- auto tie, dual fluffers
-- inground pit with inclined feed conveyor belt (60" wide) from Machinex (7242AT960DF)

Pembroke -- Identical to Renfrew except one model smaller, and the inclined feed conveyor has a level sorting section.

This particular baler was chosen for many reasons, some of the main ones being:

- 1) It produces dense, high quality bales that are absolutely necessary for handling and shipping long distances to BWMS's markets.
- 2) These model sizes matched the amount of material BWMS was projecting it would collect.
- 3) The service record for Ambaco balers is excellent.

The two balers were received and installed within a few months of each other. Installation was completed without incident although care had to be taken before hand to ensure all the electrical motors were wired to match the power at BWMS's facilities. Once installed, the machines were immediately used to bale the large backlogs of cardboard and newspaper. Both balers performed beyond expectations in terms of bale densities (5 to 10% higher), and production rates (3% higher).

2.2 Sorting Systems (Appendix B-Figure 2)

At both facilities the sorting systems consist of the conveyor, magnetic separator and densifier.

Renfrew -- Machinex raised conveyor system complete with eight steel storage bunkers.
-- Transverse magnetic separator (permanent magnet) - Ambaco
-- Machinex CD-1200 Densifier.

Pembroke -- Machinex standard conveyor system
-- Transverse magnetic separator (permanent magnet) - AMBACO
-- Machinex CD-1200 Densifier

2.2 Sorting Systems (con't)

All sections of the sorting system are necessary for its operation, therefore no recyclables could be processed until all three components were installed and functional. After several weeks of material tests with commingled plastic bottles (three groups), steel cans and aluminum cans, adjustments were required at both facilities. Adjustments to both the conveyor speed and the densifier were made to increase the density of the biscuits. Overall, the sorting system performed to specifications and left BWMS room to expand the number of items in the commingle mix.

2.3 Recycle Trucks (Appendix B-Figure 3)

For the collection of recyclables from the blue boxes and depots, BWMS purchased five recycling trucks. The MOEE funded the four trucks listed below:

- Unit 919 -- 1991 side loading Walinga (YS6 574)
- Unit 921 -- 1992 side loading Labrie (PH9 847)
- Unit 922 -- 1991 side loading Walinga (PH3 791)
- Unit 923 -- 1991 side loading Walinga (XF6 500)

These recycling trucks were designed for partial sorting of the recyclables by the drivers. They have three movable internal walls allowing for four compartments with which to segregate recyclable materials into. A side loading bucket is divided to match these compartments and it can be raised from its resting level of one meter to the top of the recycling truck to be emptied. A typical truck has the following compartments :

- #1 -- coloured container glass
- #2 -- clear container glass
- #3 -- commingled cans and plastic bottles
- #4 -- commingled paper products, cardboard and plastic film.

The recycling trucks are used for both blue box collection and 360 litre roll-out cart pick up. The recyclables in the blue boxes are sorted into the compartments as outlined above. The roll-out carts require little or no sorting by the driver. Any municipality or IC & I customer using the roll-out carts is informed how to sort their recyclables to match the compartments on the recycling trucks. The roll-out carts attach to the side loading bucket and are dumped, as many as four at a time, directly into the trucks. A 360 litre roll-out cart filled with newspaper can weigh over 200 kg, making this system of collection extremely efficient.

2.3 Recycling Trucks (con't)

The geographical area that the recycling trucks must collect recyclables from is immense, and it is not uncommon for a vehicle to be more than 100 km from both BWMS's recycling plants. This makes dumping at the plants in the middle of a recycling run rather inefficient, therefore, a truck large enough to hold an entire days collection was required. The truck manufacturers were able to increase their largest size by 15% through the addition of a larger tailgate and a longer truck body. This, combined with months of route planning allowed BWMS to make the most effective use of the new recycling trucks.

2.4 Paper Shredders (Appendix B-Figures 4 and 5)

All shredding services were consolidated at the Renfrew plant with two levels of confidentiality offered by BWMS:

- 1) High speed 1/4 inch shredding provided by an IPS shredder, Model 20-S.
- 2) Cross-cut shredding for a high degree of confidentiality with an IPS CS-20 shredder.

Since the electrical wiring was already in place from the other pieces of equipment, the shredders were relatively simple to place and install.

2.5 Floor Scales

Renfrew and Pembroke -- ASF-79-30,000 Lo-Profile floor scales complete with ramps at both ends.

The floor scales are utilized by the forklifts to weigh individual bales of recyclables or strapped bundles of aluminum for shipping purposes and internal or customer records.

2.6 Truck Scales

Renfrew and Pembroke -- ASM-11-80-100 Modu-Deck Truck scales complete with:

- UMC 600 Digital Indicators
- TM 290 Ticket Printers
- Uniweigh hardware and software
- Traffic lights

2.6 Truck Scales (con't)

Preparations are underway to install the truck scales in Pembroke and Renfrew by this fall (1994). Because their correct positioning in the yards is so vital, their start up had been delayed until the traffic flow in and around the plants was finalized. This in turn depended on where the recyclables were going to be dumped, stored, and loaded and where the final entry/exit points to the plants were to be located.

2.7 Internal Mobile Equipment (Appendix B-Figure 6)

Renfrew -- R510 Kubota wheel loader
 TCM forklift
Pembroke -- R510 Kubota wheel loader
 Toyota forklift

Both Kubotas came complete with a 3/4 cubic yard bucket, a grapple bucket, and a forklift attachment. Kubotas were chosen over Bobcats because:

- 1) There are fewer blind spots
- 2) They are a stronger, more versatile unit
- 3) Kubota's service record appeared to be better than the competition's.

All internal mobile equipment was put into use just days after its arrival.

2.8 Front Load Packer Trucks

Two front load packer trucks are used to collect corrugated cardboard and newspaper from the IC & I sector in very large volumes using six cubic yard steel boxes as storage receptacles. The trucks service the Renfrew and Arnprior areas and allow BWMS to collect large volumes of materials with minimal handling. The following units are used :

Unit 926 -- 1993 Mac front load packer (XV2 775)
Unit 927 -- 1993 Mac front load packer (XV2 789)

2.9 Shipping and Transportation Equipment

1) Mack Highway Tractor --Unit 938 (XV2 790)

BWMS found it necessary to acquire a highway tractor in order to be able to ship most of the products to market more affordably. All shipping to Ontario markets is handled by BWMS vehicles (about 95%), which greatly reduces shipping costs, and allows for greater flexibility as well as reducing delays in shipping schedules.

2) Van Trailers

Two van trailers are used for the shipping of all baled products which are sold to Ontario markets. One trailer is usually loaded at Pembroke, and one at Renfrew. Both trailers are tri-axles and have a carrying capacity of 30.8 tonnes.

Unit 929 -- Stoughton Trailer (L72 193)

Unit 930 -- Stoughton Trailer (L72 194)

3) B-Train Dump Trailers

One set of B-Train dump trailers is used for the transportation of glass and densified steel cans to the markets. The B-Train allows for up to 40 tonnes to be transported at one time, making shipping to distant markets more efficient.

Unit 931 -- Stoughton B-T 28' (M14 577)

Unit 932 -- Stoughton B-T 29" (M14 576)

2.10 Project Evolution

With all of the capital equipment in place in Renfrew and Pembroke, BWMS began the process of improving the efficiency of its operation. There have been a vast number of small alterations and adjustments to almost every aspect of the Company, however the original goals of the project have always remained the same.

The largest change has been the increase in the number of recyclables that BWMS collects. Originally the following items were collected:

- Aluminum and Steel cans
- Clear and coloured glass
- Newspaper & magazines
- Cardboard
- PETE Bottles
- HDPE Bottles

During the past year, the recyclables collected, processed and shipped has increased to include the following:

- Aluminum and Steel cans
- Aluminum foil and trays
- Boxboard
- Brown paper bags
- Clear and coloured glass
- Corrugated cardboard
- Drink boxes (Tetra paks)
- Egg cartons
- Expanded Polystyrene (Styrofoam) (pilot project)
- HDPE Plastic (natural and coloured)
- Magazines and catalogues
- Milk and juice cartons
- Mixed rigid plastics (pilot project)
- Newspapers and inserts
- Office paper (various grades)
- PETE plastic
- Phone books
- Plastic bags
- Textiles

2.10 Project Evolution (con't)

However, the original project was designed for expansion in this area, thus BWMS was able to handle it by:

- 1) Adding additional storage bays in both plants.
- 2) Adding additional personnel to the sorting lines.
- 3) Adjusting the sections in the recycling trucks to allow for the additional materials.
- 4) Adjusting the baler to bale the new material correctly.

The second largest change to the project has been the increased tonnages of recyclables BWMS now handles. The equipment has easily been able to handle the more than 40% increase since the project start, while the number of employees needed to handle this increase has risen only slightly - a testimony to the efficiency of the new equipment.

BWMS has also evolved its strategy for the IC & I sector. This element of the project gradually emerged as a major component of BWMS and the area of greatest potential growth. Because of this, a full time consultant/salesperson was hired to promote BWMS, begin recycling programs for new IC & I clients, and handle all customer relations. An example of an introductory IC & I letter to potential clients can be found in Appendix C. This correspondence would be followed by a telephone call or a personal meeting depending on the client's needs.

RESULTS & CONCLUSIONS

The objective of the project was to set up and operate recycling services throughout Renfrew County for municipalities and the IC & I sector. To this end the project has been a complete success.

As of September, 1994, BWMS will be serving all but one municipality in Renfrew County, as well as a large portion of Pontiac County, part of Lanark County and part of Lennex and Addington County. At present BWMS services approximately 300 IC & I customers including over 50 schools, four hospitals, and numerous large businesses and factories. Since this project began, BWMS has grown from a staff of approximately 10 to over 45 full time and part time employees.

Having two recycling processing facilities has been a definite advantage in trying to economically collect and process material from such a large area. The layout of the processing equipment in these plants was well researched before installation and this has allowed the recyclables to flow smoothly through both plants (Appendix D - Figures 1 and 2).

As shown in Appendix E, the monthly tonnages of most recyclables has increased steadily from July, 1993 until the present. This is due mainly to the following factors:

- 1) During the project's first year there have been additional contracts secured, especially in the municipalities surrounding Renfrew County.
- 2) Corrugated cardboard was banned at the main landfill for the City of Pembroke and surrounding area in August 1993. This not only produced the obvious effect of increasing cardboard recycling, but also raised recycling awareness across the northern portion of Renfrew County especially in the IC & I sector.
- 3) The hiring of a full time salesperson to "go after" new IC & I customers proved very successful by almost tripling the number of clients BWMS services to over 300.
- 4) Most municipal and IC & I recycling programs matured in the past year in terms of increased public awareness and usage of the blue boxes. Many of these programs have also expanded the number of recyclable items in their programs from eight to twenty.

RESULTS AND CONCLUSIONS (con't)

The final increase is largely due to the fact that BWMS is continually researching markets for new recyclable materials. Several items are being collected as pilot projects to test their feasibility, specifically in the areas of collection, processing, and marketing.

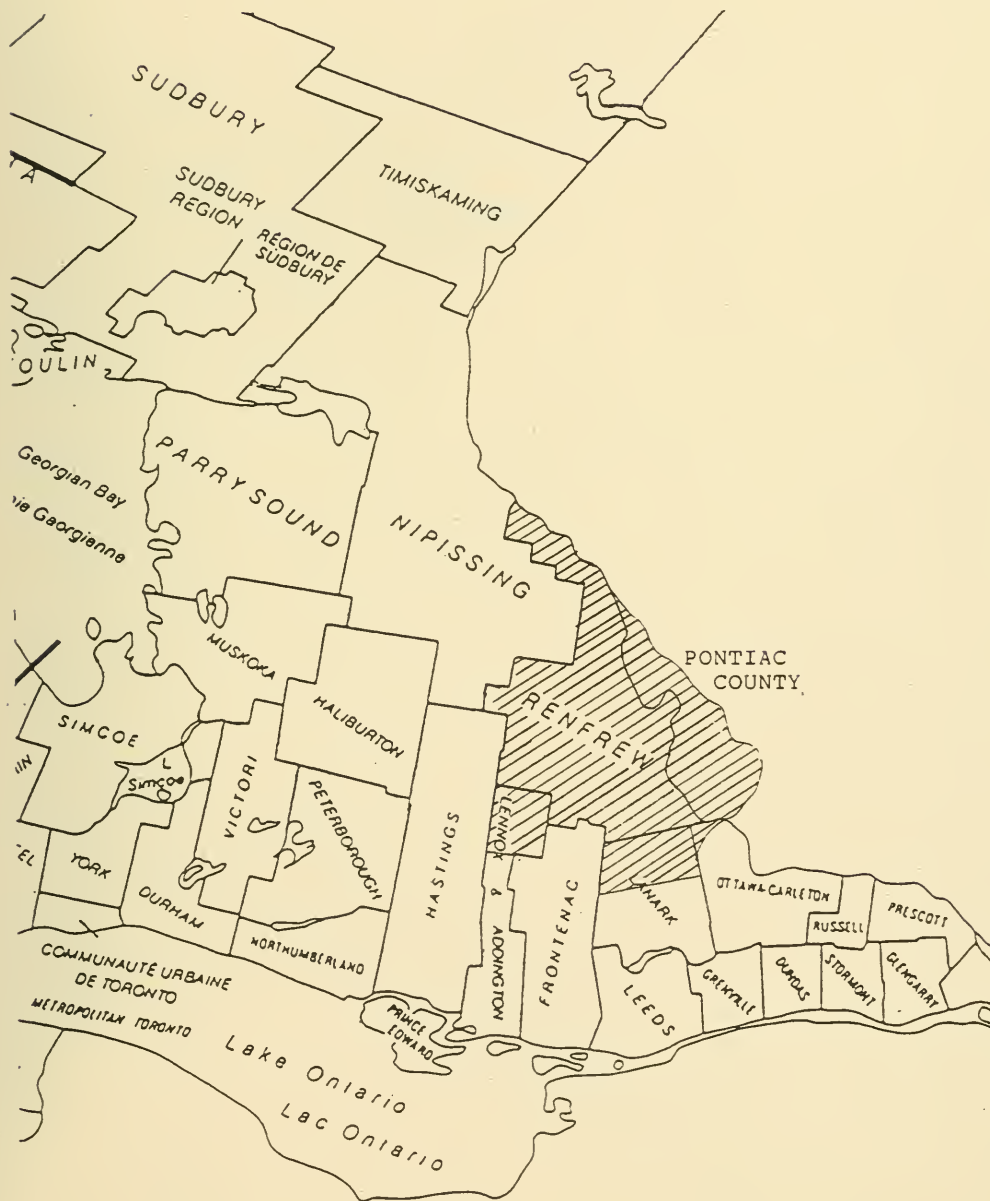
The collection portion of the project had to incorporate the fact that BWMS's collection area was extremely large but sparsely populated. To counter this problem BWMS ordered the largest recycling trucks available so that they would only have to empty once per day. The larger vehicles and some excellent routing schedules have allowed the Company to do just that.

When BWMS began the project there was limited competition in Renfrew County. Since then several companies have begun operations in the area. WMI has recycling contracts at CFB Petawawa, Ontario and is just finishing a one year contract in Arnprior (pop. 6500). Jerdar Inc. is operating in Pembroke and acts as a processing facility for WMI, consuming 30-40% of the IC & I recyclables in the City. Fibre Resources Inc. is collecting cardboard from some of the larger businesses throughout the County, especially those with their own cardboard balers. Other firms such as BFI have shown interest in municipal contracts that have been tendered in BWMS's present area of operation.

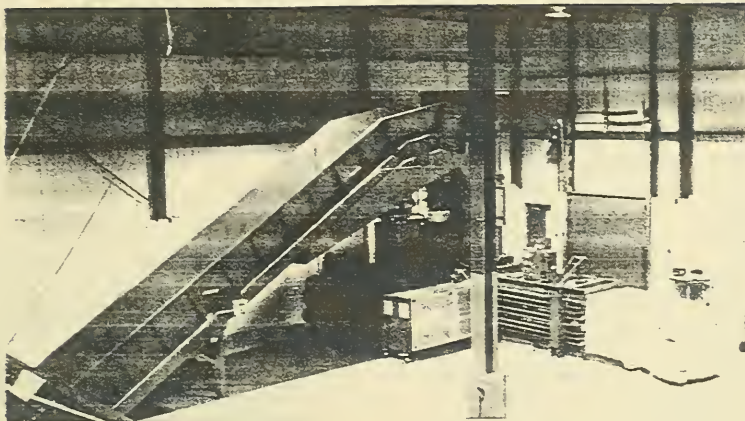
However, with the project now completed, BWMS is going to continue to strive to improve operations, our customer service, and hopefully the overall tonnages we collect.

APPENDIX A

AREA SERVICED BY BEAUMEN WASTE MANAGEMENT SYSTEMS LTD.



APPENDIX B

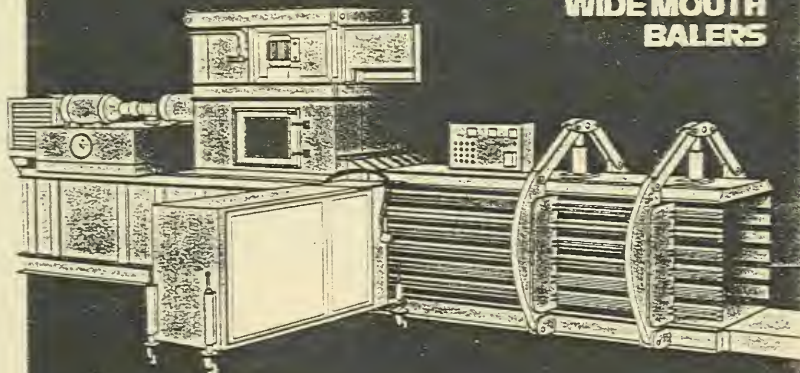


Typical use for *Machinex* conveyor feeding a baler.

The 8043 WM Series Wide Mouth Auto-Tier Balers are a showcase of proven Ambaco engineering "know-how". Their enormous feed hopper opening will accommodate almost any size of bulky product. A wide selection of power options provides optimum single ram extrusion baling for MRF systems and other multi-purpose baling applications.

- Power and pressure options tailored to your requirements
- Dual pumping systems provide redundancy and reduce power and motor starting costs
- Super-sized 80" x 41 1/2" hopper accepts most bulky materials. Reduced size hopper opening when fluffer system is used
- Superior bale densities for MRF systems. Highest capacities and densities in the industry for most recoverables
- Bolted construction with easy-to-replace wear liners

NEW! 8043 WM SERIES WIDE MOUTH BALERS



The 8043 WM is illustrated above showing dual Ambaco fluffers. For old newspapers, computer printout and most high-grade recyclables, the use of fluffers provides high production rates without an operator. In addition, fluffers assure premium quality bales from these materials—just what people expect from Ambaco.

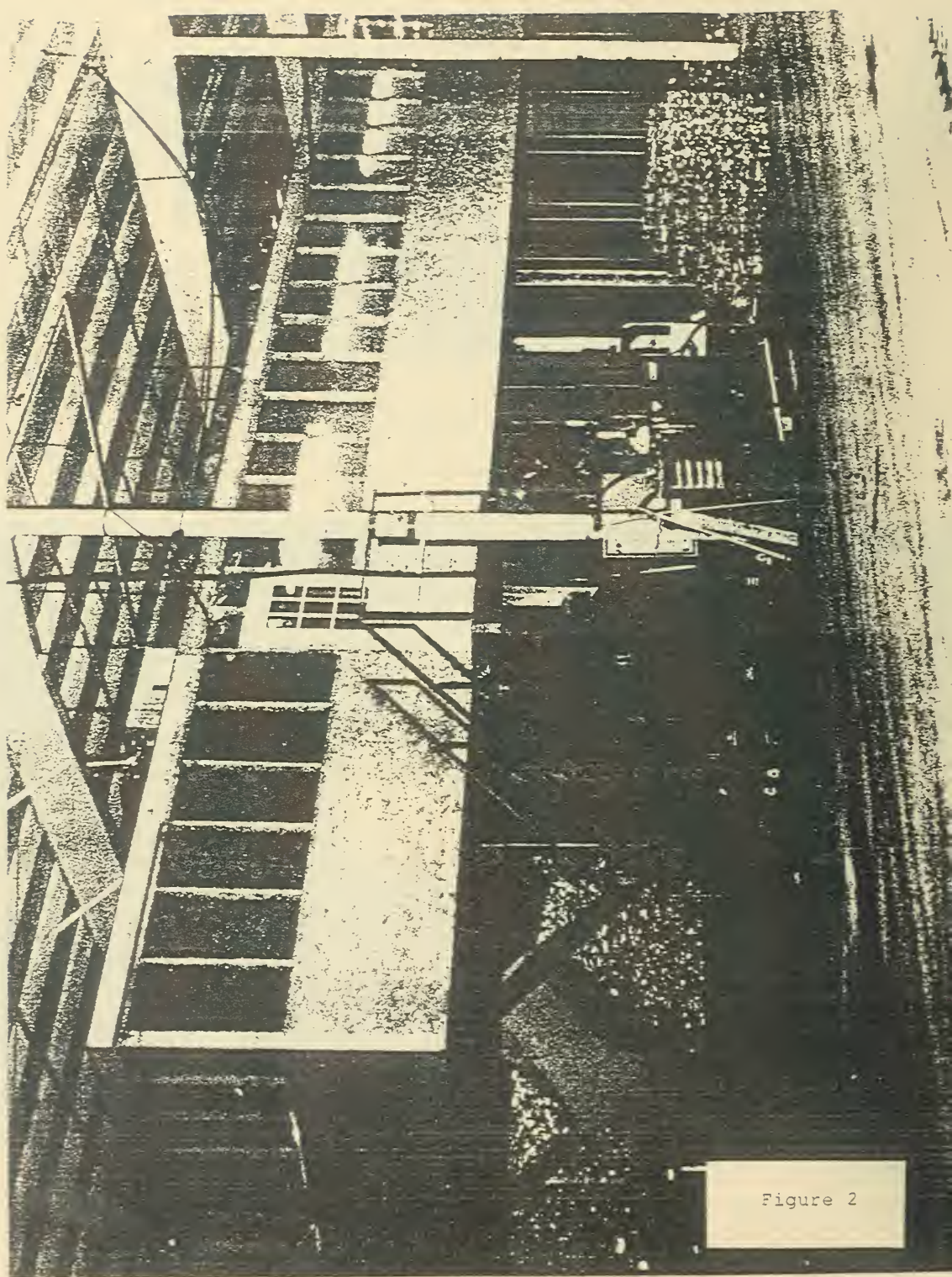


Figure 2

The Walinga Champion

The Best in The Recycling Ring



The Walinga "Champion" Recycler Unit provides top billing space for your heavy weight contender the "Blue Boxer" in the title fight against "Useless Waste".

The odds are in your favour, when you're the referee.



This old Smoothie provides the ideal location for promotional advertising to get the "RECYCLE" message across.

WALINGA
INC.



**ENGINEERED
TRANSPORTATION
EQUIPMENT**

WALINGA RECYCLING BODY

FEATURES - WALINGA CAB CONVERSION

- Factory Cab with right-hand stand-up drive, sliding door curb side and standard door street side.
- Flat back and cowl chassis with steel insulated walk through cab. Sliding doors both sides. Bi-fold optional.
- Dual controls, right-hand stand-up drive, left-hand sit-down drive.
- Optional sliding right door window.
- Additional right side windshield wiper and washer.

FEATURES - BODY

- Swing dividers adjustable at 12" intervals with man door.
- Heavy duty hydraulic front-mounted hoist.
- Hydraulic mechanical loading device to provide top loading of material.
- Long-life wear resistant FRP side and end panels.
- 10 gauge body frame with 3/16" steel floor.
- 10 gauge steel front wall section.
- Single roof lid opening.
- 12 gauge steel roof.
- Approximately 15 second complete operating cycle.
- Full swing barn doors (optional hydraulic gate).

SPECIFICATIONS

OT-37YD

Body Length I/D	252"
Floor Width I/D	50"
Roof Width I/D	92"
Width O/D	102"
Vehicle Height O/D	41 yd.
Lid Closed	142"
Lid Open	175"
Body Volume	37 cu. yds.
Body Weight (approx.)	8000 lbs.
Chassis	various suitable truck chassis.

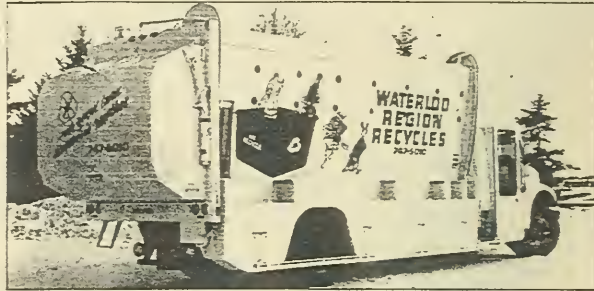
OPTIONS

- Automated roll cart mechanism to suit most carts.
- Booster seat.
- Manual side load body.
- 4 Yd. Bubble tailgate
- Custom glass compartments.
- Manual load corrugated cardboard compartment tailgate.
- Body size from 18 to 44 cubic yard capacity.



Blue box rest and hold brackets, allows for easy sorting. Both hands are free.

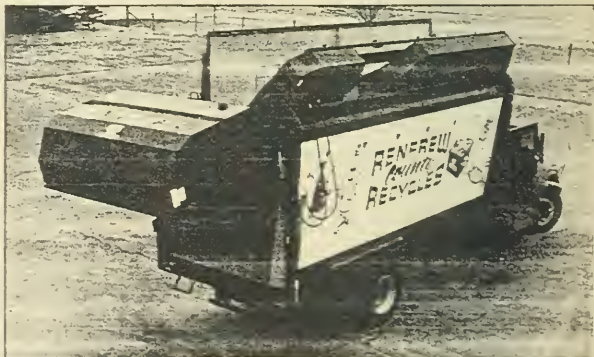
Due to continued product development, specifications are subject to change without notice. Some items shown may be optional.



Receiving hopper has a convenient low loading height. Adjustable dividers can be matched to the adjustable body dividers to suit route requirements.



The receiving hopper is designed to accommodate multiple auto lock roll cart lifters.



Take it to the top for centre discharge and maximum load. Positive material separation is enhanced with full height dividers and deflector panels.

WALINGA INC.

Engineered transportation equipment

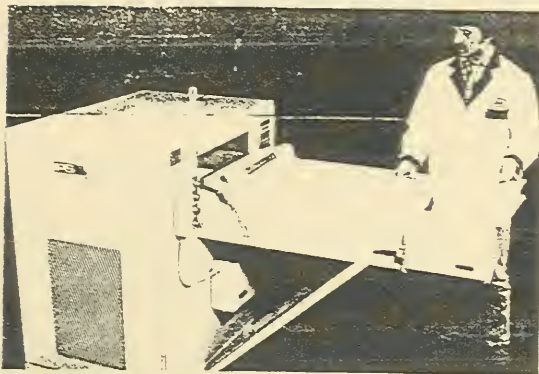
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Fax (616) 455-1787

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Fax (519) 824-5651



This brochure is printed on recycled paper.

MODEL 20-S



The largest slitter type shredder available for the largest banks, brokerage houses, data processing centers, etc. Choice of shred size with conveyor feed and spreader bar. High volume with positive security.

Throat Width — 20"

Cutting Head Width — 22"

Shred Width — $\frac{1}{4}$ ", $\frac{1}{2}$ ", 1"

Sheet Capacity — 125/300 Sheets of #20 Bond or Computer Forms

Cutting Speed — 90 Ft. per minute

Motor — 7½ HP, 208, 230, or 480 / 60 HZ / 3 phase

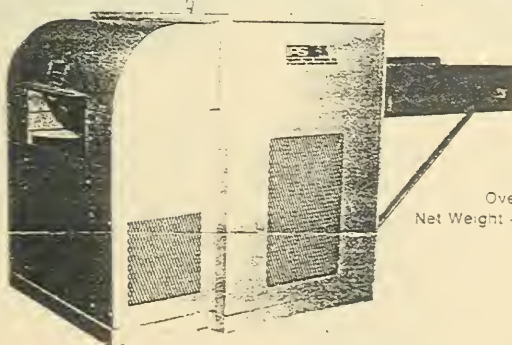
Size (H x W x L) — 46¾" x 42¾" x 78"

Net Weight — 2100 lbs. Shipping Weight — 2300 lbs.

Figure
5

CROSS SHRED® 20

An industrial capacity 20" Cross Cut Shredder for unreconstructable positive security in high volumes. Conveyor feed with dual motors.



Throat Width — 20"

Cutting Speed — 90 ft. per min.

Shred Size —

$\frac{1}{4}$ " x $\frac{7}{8}$ " or $1\frac{1}{2}$ " x $\frac{7}{8}$ " long.

Sheet Capacity — Up to 140 sheets of computer forms per pass

Motor — Dual drive motors of a 7½ & 3 HP, 230 or 480 volt

3 phase, 60 cycle

Overall Size — 43" wide, 47" high, 98" long

Net Weight — 2800 lbs. Shipping Weight — 3000 lbs.

POWERFUL AND SMOOTH OPERATOR PRODUCTIVITY.

Figure
6

QUICK REFERENCE CHART TO R510 FEATURES AND ADVANTAGES

Compact KUBOTA 4-cylinder engine

GROSS SAE J1349
Gross horsepower
50 HP @ 2,600 rpm

Easy engine maintenance

- Accessible from three sides by lifting hood
- Easy Checker™ instrument panel is equipped with hour meter, tachometer, fuel gauge, and temperature coolant gauge for monitoring all operations.

Operator station

- Comfortable working environment
- Excellent view from seat
- ROPS/FOPS canopy
- Tested in accordance with OSHA requirements

Automotive type power steering

- Orbital type for light, comfortable handling.

R510 working capacities

- Bucket hinge pin height: 10'10 2"
- Dump height: 8'3.7"
- Std. bucket capacity: ¾ cu yd.
- Operating load: 2,310 lbs.
- Lift capacity to full height: 3,300 lbs.

Super glow

- Fast starting system with

Key stop

- Engine shut-off system

Hermetically sealed wet type brake

- Seals out mud, outstanding durability and stable braking performance even on muddy ground.
- Parking brake is spring-set and hydraulic released for positive safe parking.

Rear attachments

- Counterweight (1,650 lbs.)
- 9 FT. Backhoe

Self bleeding fuel system

- Automatically removes air from fuel

Super wide base tires

- Wide tires (std) and 4WD give excellent mobility on soft/rough terrain.
- Tire size: 15.5/70—18 8PLY

Walk-through steps for easy access to the operator seat

Various front attachments

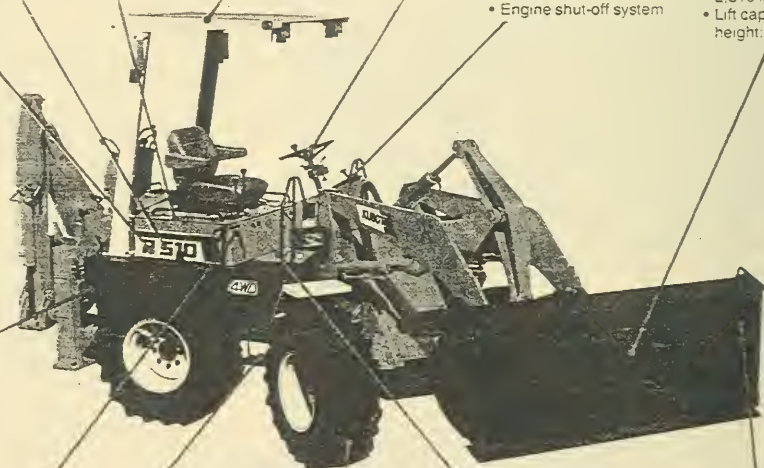
- ¾ cu.yd. general purpose bucket
- 1 cu.yd. light material bucket
- Multi purpose bucket
- Pallet forks

LST (Load Sensing Transmission)

- System ensures smooth, powerful operation.
 - LST interlocked with accelerator, eliminates engine stall even by an inexperienced operator.
 - Easy inching and start/stop on grades because the neutral brake automatically engages when the operator releases his foot from the accelerator pedal.
 - 2 (high/low) speed control with LST allows constant power control that automatically adjust travel speed for maximum torque during operation.
- Travel speed: 0 ~ 10.9 mph

Articulating system

- Small turning radius for better mobility in confined areas
- Loader clearance circle R510: 26'2"
- Frame oscillation ensures high stability even at max. articulation angle



APPENDIX C



BEAUMEN and RECYCLING
IN
INDUSTRY, BUSINESS, and INSTITUTIONS

Beaumen Waste Management Systems Ltd. offers all facilities complete and convenient recycling services. We will collect and recycle any or all of the following products depending on your requirements:

- FINE OFFICE PAPER
- CORRUGATED CARDBOARD
- VARIOUS PLASTIC BOTTLES AND CONTAINERS
- METAL FOOD AND BEVERAGE CANS
- NEWSPAPER AND MAGAZINES
- CLEAR AND COLOURED GLASS
- SPECIALTY PAPER ITEMS SUCH AS PHONE BOOKS AND MANUALS
- WE ARE ADDING NEW ITEMS TO OUR RECYCLING PROGRAM.
PLEASE ASK IF THE NEW ITEMS ARE APPLICABLE TO YOUR
BUSINESS.

Beaumen has the experience to provide an effective recycling program and the dedication to work with you to quickly solve any problems that may arise.

Beaumen also provides full waste removal services. If your future recycling efforts are not lowering your waste removal bills, or you would rather have the convenience of one company for both recycling and waste removal, call Beaumen. Our rates are competitive and our service is second to none!

RECYCLING COSTS

An experienced representative from our Sales Department can assist you to develop the recycling program that is best for your facility. We are also available to assist you in any staff education that is required.

We have a variety of receptacles which can be used throughout your facility, and for the storage of your recyclable materials. The following chart lists purchase prices for the containers as well as the collection fees.

<u>CHOICE OF RECYCLING ITEMS</u>	<u>PURCHASE PRICE/UNIT (includes delivery)</u>	<u>PICK-UP COST</u>
Regular Blue Box	\$ 6.50/box	\$ 1.25/box
Mini. Blue box	\$ 4.50/ box	N/A
Wheeled Cart (95 gallon)	\$ 109.99/cart	\$ 6.50/cart
Plastic Bags for Office Paper or Cans and Plastic		
- Box of 100 for unshredded	\$ 25.00/box	*\$ 1.15/bag **\$ 2.00/bag
- Box of 200 for shredded	\$ 45.00/box	\$ 1.15/bag
* if used for fine paper		
** if used for cans and plastic containers		
Wire bag stand	\$ 10.00	N/A

Corrugated cardboard pick up is priced according to the mode of collection required. The cheapest and most efficient method will be used after consultation between your facility and Beaumen.

WHAT IS RECYCLABLE?

FINE OFFICE PAPER

Depending on the size of your office, the fine paper can be handled in a variety of ways. In order to determine the best way of separating and sorting your paper, a visit from Beaumen is advised. Fine paper is commonly collected in the following three categories:

1. Computer Paper

- Used or unused computer printout paper for dot matrix printer.

2. White Paper

- Writing paper
- Typing paper
- Bond paper
- Letterhead paper
- Photocopy paper
- Laser printed computer paper
- Memos

3. Coloured Paper

- same examples as white paper

DO NOT INCLUDE WITH ANY OFFICE PAPER:

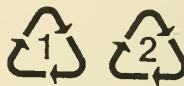
- envelopes
- carbon paper
- construction paper
- glossy paper
- heat sensitive fax paper
- Post-it notes
- file folders
- packaging paper

CORRUGATED CARDBOARD

- corrugated cardboard boxes of all sizes
- must be flattened
- must be dry, clean, empty
- no waxed cardboard

PLASTIC BOTTLES AND CONTAINERS

- all plastic bottles and containers with #1 (PETE) or #2 (HDPE) on the bottom.



PETE HDPE

- rinse or drain and discard caps.

TIN AND ALUMINUM CANS

- all metal food and beverage cans
- rinse food cans
- drain or rinse drink cans
- labels may be left on

NEWSPAPER AND MAGAZINES

- clean dry newspaper, magazines and catalogues
- include flyers

GLASS

- clear and coloured bottles and jars only
- must be drained or rinsed
- labels may be left on

SPECIALTY PAPER ITEMS

- includes phone books, and manuals, hard & soft covered books,
- special arrangements must be made for pick up.

NEW ITEMS AND SERVICES ARE BEING ADDED ALL THE TIME. PLEASE ASK US ABOUT

- RCMP APPROVED SHREDDING
- BOXBOARD RECYCLING
- MILK AND JUICE CARTON RECYCLING
- PLASTIC BAG RECYCLING
- WASTE AUDIT SERVICES

WHAT GOES WHERE ON PICK-UP DAY

1) BLUE BOXES

All of these items can be placed together in a blue box:

- all cans
- clear and coloured glass
- all plastic containers
- tied or bagged newspaper, magazines

This item must be placed in its own blue box:

- Loose newspaper, and magazines

2) WHEELED CARTS

All of these items can be placed together in a 95 gallon wheeled cart:

- all cans
- all plastic

Each of these items must be placed in their own 95 gallon wheeled cart:

- newspaper, magazines

3) PLASTIC BLUE BAGS

Each of these items must be placed in its own recycling/bag:

- A - Category 1 office paper
- B - Category 2 office paper
- C - Category 3 office paper
- D - Cans and plastic containers

On pick up day the bags will be collected. Please try to keep the weight of the bags to a maximum of 50 lbs.

4) NO CONTAINER

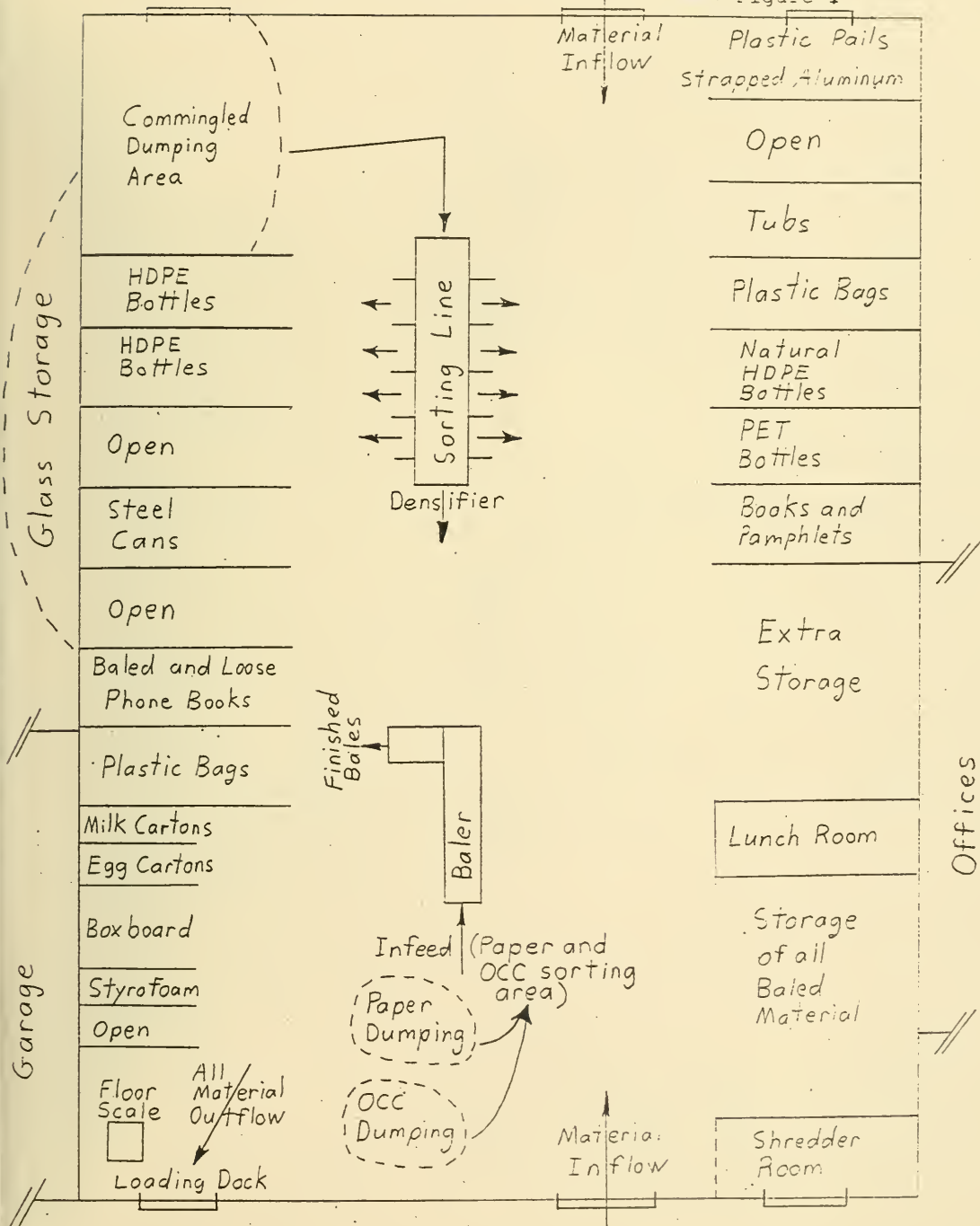
In small quantities, corrugated cardboard boxes require no collection container. Larger producers will have their specific needs discussed.

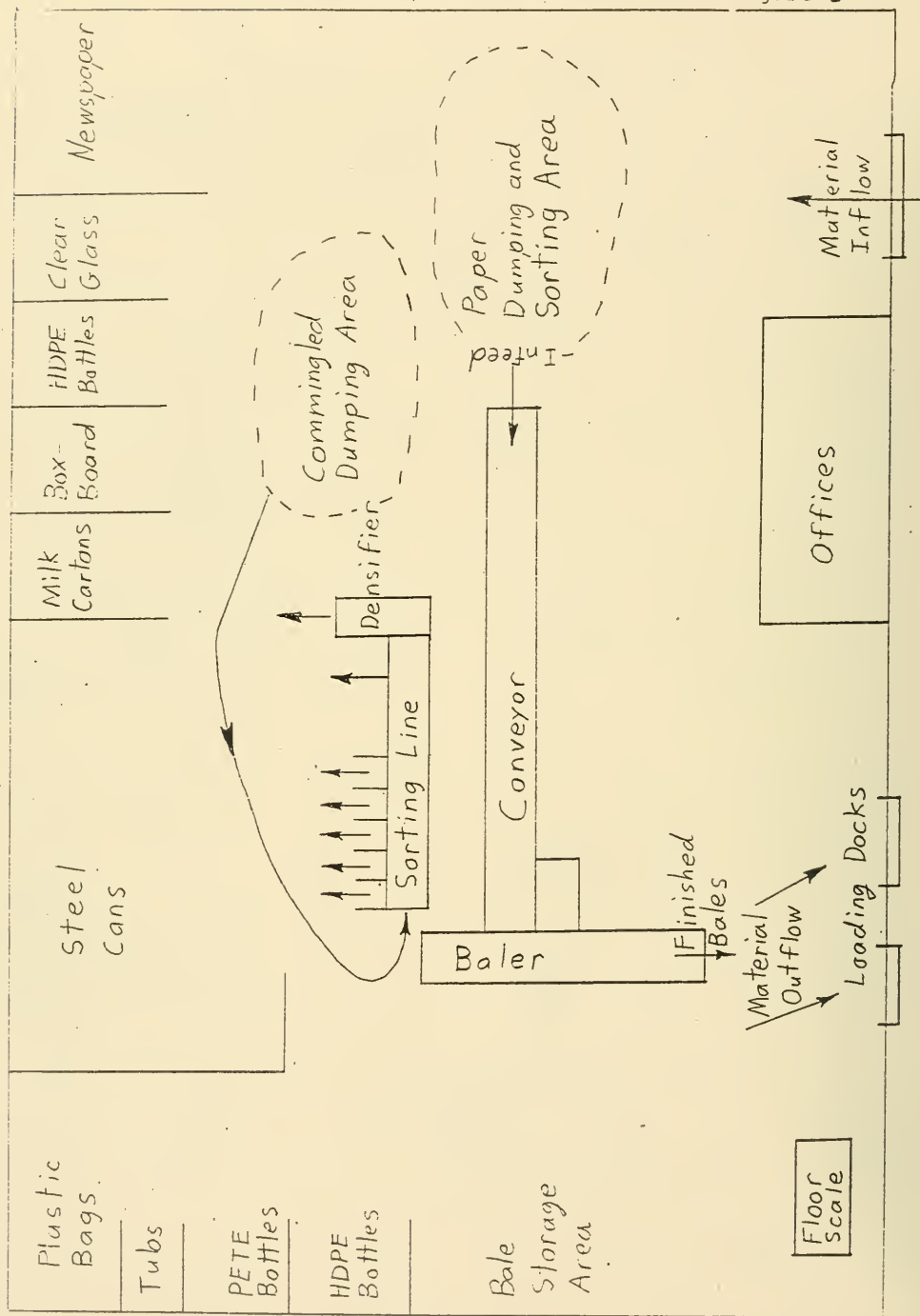


APPENDIX D

BWMS RENFREW PROCESSING PLANT

Figure 7





APPENDIX E

RENFREW AND PEMBROKE RECYCLING PLANTS -- RECEIVING AND PROCESSING (TONNERS)
JULY 1993 - JUNE 1994

PRODUCT	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APRIL	MAY	JUNE	TOTALS
ALUMINUM CANS	4.3	5.8	4.1	2.9	1.4	1.3	6.7	7.5	11.8	8.7	9.5	10.7	74.7
ALUMINUM FOIL								0.1	0.1	0.1	0.1	0.1	.5
BOXBOARD						4.1	3.2	4.7	6.3	6.0	4.9	5.2	34.4
CARDBOARD	78.4	58.1	106.9	105.0	107.4	110.0	105.6	98.5	100.9	120.2	143.4	149.6	1,304.0
COLOUR GLASS	25.8	25.1	25.5	24.8	24.9	25.2	26.9	26.2	27.8	25.6	24.8	26.7	309.3
CLEAR GLASS	56.0	54.0	55.1	46.5	45.8	45.7	58.1	54.2	53.0	47.0	45.6	50.4	611.4
EGG CARTONS						0.1				0.1	0.1	0.1	.4
FINE PAPER	5.0	5.5	5.0	5.5	6.0	5.5	15.3	18.1	26.5	20.4	21.0	23.9	157.7
MILK/JUICE CART.								0.2	0.2	0.3	0.3	0.3	1.3
NEWS/MAGAZINE	103.9	109.1	111.1	111.9	110.8	101.5	152.5	151.7	159.5	121.9	124.4	140.3	1,498.6
PLASTIC BAGS						0.1				1.6	1.8	2.0	5.5
#1-#2 MIX PLASTIC	6.9	7.6	7.1	7.3	7.2	7.0	6.5	6.7	6.9	6.3	8.6	8.1	86.2
STYROFOAM						0.1				0.1	0.1	0.1	0.4
TEXTILES	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.7	0.4	0.5	0.1	0.7	3.8
TIN CANS	44.2	48.0	42.8	32.0	16.1	15.9	52.1	51.0	52.0	27.7	28.1	29.2	439.1
GRAND TOTALS	324.6	313.3	357.7	336.0	319.7	316.6	427.2	419.6	445.4	386.5	412.0	467.4	4,527.3

